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In his discourse on chemistry Diels rejects the current etymology of this term from the Egyptian. He adopts the forms *chymes* and *chymeia* as a basis and derives them from Greek *χύμα* (metal-cast), metal-casting being in the center of antique chemical technology. A very interesting extract is given from the *Papyrus Holmiensis* in Upsala concerning Egypto-Hellenistic alchemy. At the end the author comes back to his former theory that alcohol should have been known to the Greeks, and was to a larger extent manufactured toward the close of the thirteenth century after a recipe of probably Greek origin. The article of J. Ruska in which this opinion is convincingly refuted should at least have been mentioned; also it would be interesting to know what Diels' attitude toward his opponent's arguments is.¹ The reviewer sides with Ruska and E. v. Lippmann in the opinion that the isolation of alcohol is not due to the Greeks or the Arabs, but a discovery made in Europe toward the close of the middle ages. It is justly emphasized by Ruska that with all respect for Alexandrine and Arabic science we are compelled to admit that the age of discoveries begins in the West at an earlier date than is usually assumed, and that we are not justified in contesting to the closing middle ages the discoveries then mentioned for the first time, although frequently under a false flag. The middle ages were not quite so dark and backward as believed by Diels and many others. Though we respectfully dissent from the author as to his result in the alcohol problem, we gladly concede that his study contains a great amount of new and useful information, and in the same manner as the present volume, is an important contribution to the history of science.

B. LAUFER

ASIA

Indian Shipping. A History of the Sea-Borne Trade and Maritime Activity of the Indians from the Earliest Times. RADHAKUMUD MOOKERJI. Longmans, Green and Co: London and New York, 1912. xxviii, 283 pp.

Books move slowly these days. A copy of Professor Mookerji's work reached me only in August, 1916. The history of navigation and shipping is a subject of primary importance for the study of early international relations: especially in the sphere of the Indian Ocean, tribal

¹ Compare H. Diels, "Entdeckung des Alkohols," *Abhandlungen der preussischen Akademie*, 1913, no. 3; J. Ruska, "Ein neuer Beitrag zur Geschichte des Alkohols," *Der Islam*, vol. iv, 1913, pp. 320-324, and "Alkohol and Al-kohl, zur Geschichte der Entdeckung und des Namens," *Aus der Natur*, vol. x, pp. 97-111.

migrations, ethnic movements, commercial conditions, intellectual exchanges, can be fully comprehended only by close attention to the rôle which the high seas have played in connecting India with Africa, the Archipelago, and the Far East. Mookerji is the first to give us in a handsomely printed volume a coherent survey of Indian navigation from earliest times down to the end of the Moghul period, and his account is interesting and readable from beginning to end. While it is chiefly based on well known English translations of Indian sources, the author has succeeded in finding a new Sanskrit text on ship-building by Bhoja, in which some information on various types of boats is given. A task which the ethnologist would like to see performed in this connection—a detailed study of the present-day types of Indian vessels—is unfortunately not attempted; but ships figured in ancient Indian sculpture, painting, and coins are studied to some extent and accompanied by good illustrations.

Bhoja recommends that no iron should be used in the holding or joining together of the planks of sea-going vessels, for the iron will inevitably expose them to the influence of magnetic rocks in the sea, or bring them within a magnetic field and so lead them to risks. Mr. Mookerji thinks that this warning is worth carefully noting, and that this rather quaint direction was perhaps necessary in an age when Indian ships plied in deep waters on the main. There is, of course, no reality involved here, but we face the well known legend of the Loadstone Mountain which is believed to attract toward it ships wrought with iron and to smash them to pieces. René Basset has treated this subject in an interesting manner under the title "La Montagne d'Aimant" (*Revue des traditions populaires*, 1894, pp. 377-380). Jordanus, Montecorvino, Friar Odoric, and Marco Polo have described these vessels that have no iron in their frame and are only stitched together with twine (see Yule, *Cathay*, new ed., vol. II, p. 113). In all likelihood, the legend was carried to India by the Mohammedans.

From the number of passengers given for ships in the Buddhist birth-stories (*jātaka*) Mookerji is inclined to draw inferences as to the size of the ships. This conclusion is not admissible, as such numbers as 500 or 800 are quite typical in Buddhist stories and mean nothing more than any indefinite large number. If the boat carrying the Buddha to the Sea of the Seven Gems was loaded with 700 merchants besides himself, it is evident that the figure 700 is symbolically chosen to correspond to the Seven Gems.

The discourse on the traditions of the gold-digging ants (pp. 96, 97)

lags somewhat behind the times. This legend is not Indian in its origin, but, as shown by the reviewer on a previous occasion, arose in Central Asia, where it was anciently known, and was diffused from there to India. At any rate, the fantastic explanations of Ball and Schiern, which Mookerji accepts in good faith, are far from the point.

The contrivance on the boat reproduced from the sculptures of Borobudur (plate opposite p. 46, no. 1) is not, as explained, a compass, which was not yet in existence at that time, but is simply a reel or pulley, over which the ropes for towing the vessel are run, as is plainly demonstrated in figure 5. The same device is placed both on the prow and stern of the boat (fig. 3).

The author throughout speaks of India as a unit, and ardent Indian patriot as he is, he tells us a great deal of Hindu imperialism in ancient times and India's command of the sea for ages. Here again the ethnologist will pause to raise the question what the share of the manifold tribes of India was in the navigation of the ocean, what the Aryans owe to the Dravidas, and what foreign influences on Indian boatgear and methods of shipping and navigating may have been in operation. The ancient Egyptians, Persians, Malayans, Cambodjans, Chinese, and Arabs were all sailing the Indian Ocean, and it is difficult to believe that these various peoples should not have learned from one another. This subject remains to be studied at close range. One lesson is worthy of being retained, and this is that the idea of an exclusive mastery of the sea and the destruction of rivals never entered into the minds of any of those nations, and that they plodded along one beside the other in peaceful competition till—the first Europeans arrived. The Mediterranean spectacle of Carthage and Rome was not repeated along the expanse of the Indian Ocean.

In his conclusion, Mookerji laments the want of a fully developed Indian shipping at the present time, and makes an appeal to the Government, and all who are interested in the material progress of India, "to be fully alive to the importance and necessity of reviving and restoring on modern lines a lost industry that rendered such a brilliant service in the past, and with which are so vitally bound up the prospects of Indian economic advancement."

The author should by all means be encouraged to continue his meritorious studies, but they should be founded on a broader basis. His knowledge, for instance, of the history of Java, Farther India, and China is not up-to-date, chiefly owing to his failure to read French literature. As to the Arabic and Persian sources, G. Ferrand's *Relations de voyages et textes géographiques relatifs à l'Extrême-Orient* must be

consulted. The failure to utilize Chao Ju-kua in the translation of Hirth and Rockhill, where numerous references to shipping and sailing could have been gathered, is a serious drawback. Chao Ju-kua is referred to but once (p. 170), and wrongly designated as a Chinese traveler of the thirteenth century. He did not travel at all, however, but collected his notes on foreign trade and peoples, while stationed as Inspector of Maritime Trade at the port of Ts'üan-chou in Fu-kien Province.

B. LAUFER

Guide au Musée de l'École française d'Extrême-Orient. H. PARMENTIER.
Hanoi: Imprimerie d'Extrême-Orient, 1915. 136 pp. 32 pls.

Few modern seats of learning have had a more glorious history than the École française d'Extrême-Orient, founded in 1898 at Hanoi, French Indo-China, by Governor General Doumer at the instigation of the Institut de France. In the first line the École is a research institute entrusted with the task of exploring the archaeology and ethnology of Indo-China, which, owing to the peculiar cultural position of this region, necessitates close study of both India and China and the interrelations of the two countries. The publications of the School are hence devoted to indology as well as sinology, the center of gravitation being directed toward Farther India. The annual Bulletin, of ambitious size, fifteen volumes of which have been issued, has earned the well-deserved reputation of being the leading and most solid periodical in all scientific matters relating to the East: every contribution contained in it is of importance and signals a decided advance in our knowledge of the subject. Besides this Journal, the School has published twenty special volumes concerned with philology, bibliography, numismatics, and archaeology,—all fundamental works of permanent value. The practical duty imposed upon it is to preserve the historical monuments of Indo-China, to propose the necessary measures for their protection, and to watch the execution of the orders insuring their safeguarding. Two precious instruments of work are at the disposal of the institution,—a library particularly rich in manuscripts and rubbings of inscriptions, and an ethnographical and archaeological museum. Not many among us may know that the city of Hanoi is even favored with two museums, the other being the Musée Agricole et Commercial, which harbors selected examples of the modern industrial art of Indo-China. The museum of the École is under the able guidance of H. Parmentier, an architect and art student of note, who directs the archaeological work of the institution. We owe to him